How Islam changed medicine

**Arab physicians and scholars laid the basis for medical practice in Europe**

Islamic civilization once extended from India in the east to the Atlantic Ocean in the west. Buildings in Andalusia such as the Alhambra in Granada, the Mezquita in Cordoba, and the Giralda in Seville are reminders of the architectural imprint this civilization left on western Europe. Less well remembered, however, is the impact of Islamic civilization on Western science, technology, and medicine between the years 800 and 1450.1 As was argued this month at the Royal Institution, today’s Western world might look very different without the legacy of Muslim scholars in Baghdad, Cairo, Cordoba, and elsewhere.2

As Islam spread out of the Arabian Peninsula into Syria, Egypt, and Iran it met long established civilisations and centres of learning. Arab scholars translated philosophical and scientific works from Greek, Syriac (the language of eastern Christian scholars), Pahlavi (the scholarly language of pre-Islamic Iran), and Sanskrit into Arabic. The process of translation reached its peak with the establishment of the “House of Wisdom” (Bait-ul-Hikma) by the Abbasid Caliph Al-Mamun in Baghdad in 830. It made Arabic the most important scientific language of the world for many centuries and preserved knowledge that might otherwise have been lost forever.

As well as assimilating and disseminating the knowledge of other cultures, Arab scholars made numerous important scientific and technological advances in mathematics, astronomy, chemistry, metallurgy, architecture, textiles, and agriculture. Techniques they developed—such as distillation, crystallisation, and the use of alcohol as an antiseptic—are still used.

Arab physicians and scholars also laid the basis for medical practice in Europe. Before the Islamic era, medical care was largely provided by priests in sanatoriums and annexes to temples. The main Arabian hospitals were centres of medical education and introduced many of the concepts and structures that we see in modern hospitals, such as separate wards for men and women, personal and institutional hygiene, medical records, and pharmacies.

Ibn Al-Nafis, a 13th century Arab physician, described the pulmonary circulation more than 300 years before William Harvey.3 Surgeon Abu Al-Qasim Al-Zahrawi wrote the *Tasrif* which, translated into Latin, became the leading medical text in European universities during the later Middle Ages. Al-Zahrawi was also a noted pathologist, describing hydrocephalus and other congenital diseases as well as developing new surgical technologies such as catgut sutures.4,5 Some describe Al-Razi (Rhazes), born in 865, as the greatest physician of the Islamic world. He wrote *Kitab Al-Mansuri* (*Liber Almartsoris* in Latin), a 10 volume treatise on Greek medicine,6 and also

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How Google is changing medicine

A medical portal is the logical next step

What a remarkable year it has been for those of us monitoring changes in the global information landscape. Since last Christmas, there has been a flurry of activity: the digitisation of the world's libraries began in earnest (despite the copyright fracas); open access publishing gained much-needed support internationally (especially in science and medicine); and Google, MSN Search, and Yahoo introduced a number of customisation tools for desktops and mobiles, podcasts, blogs, and video searches.

Google's influence and power is writ large in the search field—so large that librarians are asking themselves some difficult questions. With all of this technology and freely available digital information, what will happen to physical libraries? Google's mission is to provide access to the world's information—but this is librarians' mission too. Will they be needed in the new information age?

For all the benefits technology provides, it does provoke anxiety. In a recent letter in the New England Journal of Medicine, a New York rheumatologist describes a scene at rounds where a professor asked the presenting fellow to explain how he arrived at his diagnosis. ‘Matter of factly, the reply came: “I entered the salient features into Google, and [the diagnosis] popped right up.” The attending doctor was taken aback by the Google diagnosis. “Are we physicians no longer needed? Is an observer who can accurately select the findings to be entered in a Google search all we need for a diagnosis to appear—as if by magic?”

In a post-Google world, where evidence-based education is headed is anyone's guess. Googling your diagnosis; Googling your treatment—where is all this leading us?

Google has won the battle of the search engines, at least for the time being (see example in table), and its more serious minded offspring, Google Scholar, is rapidly gaining ground. Within a year of its release Google Scholar has led more visitors to many biomedical journal websites than has PubMed (J Sack, personal communication, 2005). Once they discover it, many medical students and doctors prefer Google Scholar. Although both tools benefit from Google's trademark simplicity, Google Scholar indexes more peer reviewed literature. Google Scholar is especially quick in locating highly cited items and the proverbial needle in a haystack. Doctors are encouraged to consult Google Scholar for browsing and serendipitous discovery, not for literature reviews; and they should use the advanced search page to find words and names that occur often in the medical literature.

Which search engines bring visitors to bmj.com (November 2005)

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The flow of technology and ideas from the Islamic world to the West slowed and, in the past 600 years, has reversed. Academics and politicians still debate the reasons for and consequences of this decline in Islamic science and technology. The legacy of Islamic civilisation, though, remains with us in making possible Europe's own scientific and cultural renaissance.

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